



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Lewisville Aquatic Ecosystem Research Facility (LAERF)

Purpose

The Lewisville Aquatic Ecosystem Research Facility (LAERF) in Lewisville, Texas, is an experimental pond facility that supports studies on biology, ecology, and management of aquatic plants. LAERF provides an intermediate-scale research environment to bridge the gap between small-scale laboratory studies and large-scale field tests.



Specifications

- 53 earthen and 21 lined ponds.
- 18 flowing water raceways.
- 3 large outdoor mesocosm facilities. One outdoor chemical control mesocosm system consists of 30 fiberglass mesocosm tanks with a capacity of 6,000 L (2.5 m in diameter by 1.5 m deep) and 24 tanks with a capacity of 1,845 L. These tanks are supplied with filtered, alum-treated lake water from a lined water supply pond. Mesocosms can be operated under static or flow-through conditions with submersed aquatic plants growing in containers of sediment. The mesocosm system is used to study the effects of aquatic herbicides on target and nontarget organisms as well as to conduct studies on aquatic plant biology and ecology. Another deepwater mesocosm system consists of 18 fiberglass tanks (14,000-L capacity; 2.5 m in diameter by 3 m deep). These tanks share the water supply with the chemical control mesocosm system. Deepwater mesocosms are used to study seasonal growth and development of problem aquatic plants under low light conditions.
- A research greenhouse. The greenhouse contains 20 temperature-controlled fiberglass tanks (1,200-L capacity) that can be filled with filtered, alum-treated lake water from a 20,000-L storage tank. This system is used to conduct short-term, controlled experiments to supplement longer-term studies in ponds.
- Several laboratories to conduct research activities. An onsite analytical laboratory is equipped for processing and analyzing water, plant, and sediment samples in support of research being conducted at LAERF or in the field. An ongoing water chemistry monitoring program provides information on experimental conditions occurring in ponds, mesocosms, and greenhouse tanks. Other onsite laboratory facilities are equipped to support studies of aquatic plants conducted in ponds, mesocosms, raceways, and greenhouses as well as studying physiological processes such as photosynthesis and respiration. Currently, 12 Hydrolab water chemistry data acquisition units are available.



Benefits The LAERF provides managers with effective, economical, and environmentally compatible technologies for the assessment and management of problem aquatic plants, and the establishment of native plants and ecosystem restoration. These technologies are a significant asset in implementing clean water initiatives by restoring aquatic systems harmed by non-indigenous aquatic plant species. The unique capabilities of the LAERF can result in significant cost savings, as the facility has the capability to conduct short-term controlled experiments if there is not a need for large-scale field tests and long-term studies.

Success Stories An ongoing research effort with the Texas Parks and Wildlife Department (TPWD) has introduced native aquatic plants into unvegetated reservoirs, providing much-improved aquatic habitat for fish and wildlife.

Cooperative research between the LAERF and the South Florida Water Management District has significantly slowed the spread of torpedograss in Lake Okeechobee.

Research at Lake Texoma in Texas has resulted in a significant improvement in water chemistry of the lake.

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